

***What Is Claimed Is:***

1           1.       A method for communicating between graphics memory storage  
2 elements, comprising the steps of:

3                   (a)     reading a set of data into a set of graphics memory storage  
4 elements wherein one or more of a plurality of channels have been dedicated for  
5 data storage;

6                   (b)     identifying, for each graphics memory storage element in  
7 said set of graphics memory storage elements, an address wherein said identified  
8 address can comprise one or more dimensions;

9                   (c)     recalling each said identified address for each graphics  
10 memory storage element where specific data is stored; and

11                  (d)     using said recalled addresses to retrieve said specific data  
12 into another set of graphics memory storage elements wherein one or more of a  
13 plurality of channels have been dedicated for data storage.

1           2.       A method for executing single instruction, multiple data (SIMD)  
2 instructions using graphics technology, comprising the steps of:

3                   (a)     reading a set of data into a set of texels wherein one or  
4 more of a plurality of channels have been dedicated for data storage;

5                   (b)     identifying, for each said texel in said set of texels, an  
6 address wherein said address may comprise one or more dimensions;

7                   (c)     receiving a set of SIMD instructions;

8                   (d)     translating said set of SIMD instructions into a set of  
9 graphics API commands;

10                  (e)     distinguishing a set of specific data, from said set of data,  
11 needed for said set of SIMD instructions;

12                  (f)     recalling each said identified address for each said texel  
13 wherein said specific data is stored;

14 (g) selecting frame buffer pixels to be used to support said set  
15 of SIMD instructions;

16 (h) using said recalled addresses to retrieve said specific data  
17 into said selected frame buffer pixels wherein one or more of a plurality of  
18 channels have been dedicated for data storage; and

19 (i) performing said set of SIMD instructions on said retrieved  
20 set of specific data in said selected frame buffer pixels.

1 3. The method according to claim 2, further comprising, in place of  
2 step (a), the step of:

3 (a) copying a set of data, stored in a set of frame buffer pixels,  
4 into a set of texels wherein one or more of a plurality of channels have been  
5 dedicated for data storage.

1 4. The method according to claim 3, further comprising, prior to step  
2 (a), the step of reading a set of data into a set of frame buffer pixels wherein one  
3 or more of a plurality of channels have been dedicated for data storage.

1 5. The method according to claim 2, further comprising the step of  
2 storing said recalled addresses in said selected frame buffer pixels wherein each  
3 dimension of said recalled addresses is stored in a different dedicated channel and  
4 wherein each said stored address defines a particular texel from which a particular  
5 piece of data, from said set of specific data, will be retrieved.

1 6. The method according to claim 2, further comprising the step of  
2 storing said recalled addresses in selected texels in a second texture memory  
3 wherein each dimension of said recalled addresses is stored in a different dedicated  
4 channel and wherein each said stored address defines a particular texel from which  
5 a particular piece of data, from said set of specific data, will be retrieved.

1 7. The method according to claim 6, further comprising, after the step  
2 of storing, the step of retrieving said stored addresses from said selected texels in  
3 said second texture memory to said selected frame buffer pixels.

1 8. The method according to claim 2, further comprising thereafter the  
2 step of storing results of said performed set of SIMD instructions in same said  
3 selected frame buffer pixels.

1 9. The method according to claim 2, wherein software used to  
2 support the method is a graphics application programming interface.

1 10. The method according to claim 9, wherein said graphics application  
2 programming interface is OpenGL with a pixel texture extension.

1 11. A system for communicating between graphics memory storage  
2 elements, comprising:

3 (a) means to receive a set of data into a set of graphics memory  
4 storage elements wherein one or more of a plurality of channels have been  
5 dedicated for data storage;

6 (b) means to identify, for each graphics memory storage  
7 element in said set of graphics memory storage elements, an address wherein said  
8 identified address can comprise one or more dimensions;

9 (c) means to recall each said identified address for each  
10 graphics memory storage element where specific data is stored; and

11 (d) means to use said recalled addresses to retrieve said specific  
12 data into another set of graphics memory storage elements wherein one or more  
13 of a plurality of channels have been dedicated for data storage.

1 12. A system for executing single instruction, multiple data (SIMD)  
2 instructions using graphics technology, comprising:

3 (a) means to receive a set of data into a set of texels wherein  
4 one or more of a plurality of channels have been dedicated for data storage;

5 (b) means to identify, for each said texel in said set of texels,  
6 an address wherein said address may comprise one or more dimensions;

7 (c) means to receive a set of SIMD instructions;

8 (d) means to translate said set of SIMD instructions into a set  
9 of graphics API commands

10 (e) means to distinguish a set of specific data, from said set of  
11 data, needed for said set of SIMD instructions;

12 (f) means to recall each said identified address for each said  
13 texel wherein said specific data is stored;

14 (g) means to select frame buffer pixels to be used to support  
15 said set of SIMD instructions;

16 (h) means to use said recalled addresses to retrieve said specific  
17 data into said selected frame buffer pixels wherein one or more of a plurality of  
18 channels have been dedicated for data storage; and

19 (i) means to perform said set of SIMD instructions on said  
20 retrieved set of specific data in said selected frame buffer pixels.

1 13. The system according to claim 12, further comprising means to  
2 copy a set of data, stored in a set of frame buffer pixels, into a set of texels  
3 wherein one or more of a plurality of channels have been dedicated for data  
4 storage.

1 14. The system according to claim 13, further comprising means to  
2 read a set of data into a set of frame buffer pixels wherein one or more of a  
3 plurality of channels have been dedicated for data storage.

1 15. The system according to claim 12, further comprising means to  
2 store said recalled addresses in said selected frame buffer pixels wherein each

3 dimension of said recalled addresses is stored in a different dedicated channel and  
4 wherein each said stored address defines a particular texel from which a particular  
5 piece of data, from said set of specific data, will be retrieved.

1 16. The system according to claim 12, further comprising means to  
2 store said recalled addresses in selected texels in a second texture memory  
3 wherein each dimension of said recalled addresses is stored in a different dedicated  
4 channel and wherein each said stored address defines a particular texel from which  
5 a particular piece of data, from said set of specific data, will be retrieved.

1 17. The system according to claim 16, further comprising means to  
2 retrieve said stored addresses from said selected texels in said second texture  
3 memory to said selected frame buffer pixels.

1 18. The system according to claim 12, further comprising thereafter  
2 means to store results of said performed set of SIMD instructions in same said  
3 selected frame buffer pixels.

1 19. The system according to claim 12, wherein software used to  
2 support the system is a graphics application programming interface.

1 20. The system according to claim 12, wherein said graphics  
2 application programming interface is OpenGL with a pixel texture extension.

1 21. A system for communicating between graphics memory storage  
2 elements, comprising:

3 (a) a texture memory for receiving a set of data into a set of  
4 texels wherein one or more of a plurality of channels have been dedicated for data  
5 storage;

6 (b) an address calculator for identifying, for each texel in said  
7 set of texels, an address wherein said identified address can comprise one or more  
8 dimensions;

9 (c) a frame buffer for storing each said identified address, for  
10 each texel where specific data is stored, into a selected set of pixels wherein one  
11 or more of a plurality of channels have been dedicated for address storage; and

12 (d) a pixel-to-pixel communicator for using said stored  
13 addresses to retrieve said specific data into said selected set of pixels wherein one  
14 or more of a plurality of channels have been dedicated for data storage.

1 22. A system for communicating between graphics memory storage  
2 elements, comprising:

3 (a) a frame buffer for receiving a set of data into a set of pixels  
4 wherein one or more of a plurality of channels have been dedicated for data  
5 storage;

6 (b) an address calculator for identifying, for each pixel in said  
7 set of pixels, an address wherein said identified address can comprise one or more  
8 dimensions;

9 (c) a texture memory for storing each said identified address,  
10 for each pixel where specific data is stored, into a selected set of texels wherein  
11 one or more of a plurality of channels have been dedicated for address storage;  
12 and

13 (d) a pixel-to-pixel communicator for using said stored  
14 addresses to retrieve said specific data into said selected set of texels wherein one  
15 or more of a plurality of channels have been dedicated for data storage.

1 23. A system for executing single instruction, multiple data (SIMD)  
2 instructions using graphics technology, comprising:

3 (a) a texture memory for receiving a set of data into a set of  
4 texels wherein one or more of a plurality of channels have been dedicated for data  
5 storage;

6 (b) an address calculator for identifying, for each said texel in  
7 said set of texels, an address wherein said address may comprise one or more  
8 dimensions;

9 (c) a SIMD graphics API translator for receiving a set of  
10 SIMD instructions, for translating said set of SIMD instructions into a set of  
11 graphics API commands, for distinguishing a set of specific data, from said set of  
12 data, needed for said set of SIMD instructions, and for selecting frame buffer  
13 pixels to be used to support said set of SIMD instructions;

14 (d) a frame buffer for storing each said identified address, for  
15 each texel where specific data is stored, into a selected set of pixels wherein one  
16 or more of a plurality of channels have been dedicated for address storage;

17 (e) a pixel-to-pixel communicator for using said stored  
18 addresses to retrieve said specific data into said selected set of pixels wherein one  
19 or more of a plurality of channels have been dedicated for data storage; and

20 (f) a graphics accelerator for performing said set of SIMD  
21 instructions on said retrieved set of specific data in said selected frame buffer  
22 pixels.